

REMARKS

The paper is in response to the Office Action mailed September 14, 2010 ("the Office Action"). The foregoing amendment cancels claims 1-20 and amends claims 21, 50, and 52. Claims 21-52 remain pending in view of the amendments. Applicants respectfully request reconsideration of the application in view of the above amendments to the claims and the following remarks. For Examiner's convenience and reference, Applicants present remarks in the order that the Office Action raises the corresponding issues.

In connection with the prosecution of this case and any related cases, Applicants have, and/or may, discuss various aspects of the disclosure of the cited references as those references are then understood by the Applicants. Because such discussion could reflect an incomplete or incorrect understanding of one or more of the references, the position of the Applicants with respect to a reference is not necessarily fixed or irrevocable. Applicants thus hereby reserve the right, both during and after prosecution of this case, to modify the views expressed with regard to any reference.

Please note that Applicants do not intend the following remarks to be an exhaustive enumeration of the distinctions between any cited references and the claims. Rather, Applicants present the distinctions below solely by way of example to illustrate some of the differences between the claims and the cited references. Finally, Applicants request that Examiner carefully review any references discussed below to ensure that Applicants' understanding and discussion of any reference is consistent with Examiner's understanding.

Unless otherwise explicitly stated, the term "Applicants" is used herein generically and may refer to a single inventor, a set of inventors, an appropriate assignee, or any other entity or person with authority to prosecute this application.

35 U.S.C. § 101

The Office Action rejects claim 52 as being directed to non-statutory subject matter including a medium encompassing a signal. Claim 52 has been amended to limit the claim to "non-transitory" subject matter excluding a signal. As such, the Applicant respectfully requests that the rejection of claim 52 be withdrawn.

Rejection under 35 U.S.C §103(a)

The Office Action rejects claims 21-25, 27-40 and 52 under 35 U.S.C §103(a) over *Ohtomo et al* (U.S. Patent No. 6,859,269) in view of *Turner et al* (European Patent Publication 0587328 A2).

The Office Action rejects claims 41-51 under 35 U.S.C §103(a) over *Ohtomo et al* (U.S. Patent No. 6,859,269) in view of *Turner et al* (European Patent Publication 0587328 A2) in further view of *Alhadeef et al* (U.S. Patent Publication No. 2003/0202089).

The Office Action rejects claim 26 under 35 U.S.C §103(a) over *Ohtomo et al* (U.S. Patent No. 6,859,269) in view of *Turner et al* (European Patent Publication 0587328 A2) in further view of Applicant admitted prior art.

Under 35 U.S.C §103(a), "[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." According to MPEP §2142, "[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness." Finally, MPEP 2141.III notes that:

"The key to supporting any rejection under 35 U.S.C. 103 is the *clear articulation of the reason(s) why the claimed invention would have been obvious*. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396." (emphasis added)

A. The Present Application

The present application concerns a method for determining an actual position of a geodetic instrument.

The geodetic instrument comprises a positioning system for determining its position by a reception of signals such as GPS-signals, if those signals are available, e.g. in open field with a clear view of a wide range of sky and GPS-satellites.

Nevertheless, there are certain situations, where the determination of the actual position is difficult, or even impossible, due to the fact that the signals, on which the positioning system relies, are limited, or not available, because the geodetic instrument with its positioning system is located in a dead range of the signals. The dead range is an area where one or more of the signals for the positioning system are not available to an extent that enables the determination of the position. For example, this can occur when the signals are shadowed by some obstacles and can therefore not be received by the positioning system for determining the position. As for another more specific example, this can occur in narrow street canyons, underneath shed roofs or in the woods, where a view of the sky and the reception of the PS-satellite signals is limited or impossible.

As knowledge of the actual position is a necessity in surveying, the method according to the invention overcomes this problem by the claimed recording of at least two pieces of image information from locations which are not shadowed and where the positioning system is capable of determining the position of the instrument. Those pieces of images information comprise at least two natural or artificial reference structures.

By referencing the before mentioned reference structures in a third piece of image information, recorded from a location of the geodetic instrument which is actually positioned in a shadowed dead range where a determination of the actual position by the positioning system is limited or even not possible, the present invention allows the determination of the actual position of the geodetic instrument by referencing relative to the at least two reference structures. Thereby, a surveying from an actual position inside of the shadowed dead range is made possible.

The method according to the present application, therefore, allows determining the geodetic instruments position, even if it is located in a "dead range" where the positioning system malfunctions. This allows a surveying to be conducted from locations which would otherwise not be possible due to the lack of position knowledge.

B. The References Cited

1. Ohtomo

The teaching of Ohtomo (US 6,859,269) refers to a surveying instrument comprising an image pick-up means for picking up an image of a surveyed scenery.

The object of Ohtomo is to prepare a 3D-model with photo-textures by synthesizing multiple picked up images. For this purpose, the surveying instrument and the picked up images are spatially referenced, e.g. by GPS. The spatially referencing of the images is achieved by picking up the images from known points (e.g. instrument positions determined by GPS) and by a position surveying (horizontal angle, vertical angle and distance) of the imagined object from the known point where the instrument is sited. Thereby, the image itself can be associated with positional data of the image's content. The availability of image data and spatial position of the image's view, allows the desired 3D modeling by more than one images acquired in this way.

If, from a first known point of view X, a portion of the image is lacking, for example by some obstruction as the tree 51 in figure 5, this part of the image can be complemented by another image taken from another, second known point of view M, from which the previously obstructed portion is visible.

The device thereby allows gaining a "complete" picture of a surveyed object, by blinding out obstructions which otherwise would hide certain portions of the image, which would otherwise not be visible on the synthesized image of the construction.

2. *Turner*

The teaching of Turner (EP 0 587 328) refers to a system and method for 3D location of an object from multiple cameras placed at different fixed and known locations.

By a defined placement of markers in the field of view of all the cameras and the known geometrical arrangement of cameras and markers, an image processing allows to spatially reference an object within the field of view of the cameras. The locations of the cameras and markers are required to be known for the method to work, as also recited in claim 1 and col. 5, lines 8-10.

The presented principle of projecting a point of interest onto a "virtual plane" defined by the markers and calculating the intersection of virtual projection directions in 3D space allows a determination of the 3D position of an object in the field of view relative to the system.

C. Differentiation of the Claimed Invention from the References

The invention claimed is clearly different from the combination of Ohtomo and Turner. In contrast to Ohtomo, which can "recover" shaded image portions by multiple images from different known points of view, the present application allows a determination of the actual position of a geodetic measuring instrument based on multiple pieces of image information, even though the instrument's positioning system is shaded at the actual position and can, therefore, not be determined by the positioning system. The positions wherefrom images are taken in Ohtomo are always known and not subject of determination. A shaded positioning system can not be found in Ohtomo, only a shaded image portion.

The shading in an image and the shading of a positioning system are not the same, or even related. A skilled person, confronted with the problem of determining an instrument's position would not consider a document related to the recovery of shaded image portions. Even if the document would have been considered, a skilled person would not have found any teaching to overcome of a limited usability of a positioning system.

Moreover, Turner does not teach or suggest a position determination in areas where the functionality of the positioning system is limited as in the Applicant's invention. A determination of the position of the system itself, or of one of the cameras, is not addressed or of a concern by Turner. According to Turners claim 1, the locations of cameras are entered and have therefore to be known for the system to work properly.

Therefore, as both documents do not directly relate to the problem and solution of the present invention, also their combination would not have lead a skilled person to the presently claimed invention, the Applicant respectfully requests that the rejections be withdrawn.

Quite simply, Ohtomo only concerns a "lacking of an image portion". A dead range with respect to signals of the positioning system does not exist anywhere Ohtomo. This lack of a basis is even more apparent as this is not even the problem addressed by Ohtomo. And, the resulting consequences as well as the the solution of a lack of position information is nowhere found in Ohtomo. Rather, in Ohtomo the images are always acquired from known positions, even point M is definitely known, as is measured from point X.

Thus, not only do Turner and Ohtomo fail to teach or suggest the claimed invention, the combination of references also are not directed to a similar problem being solved or relevant solution. As such, the Applicant respectfully requests that the rejections be withdrawn for these reasons as well.

Charge Authorization

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37 CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 23-3178.

CONCLUSION

In view of the foregoing, Applicants submit that the pending claims are allowable. In the event that Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview or overcome by an Examiner's Amendment, Examiner is requested to contact the undersigned attorney.

Dated this 8th day of December, 2010.

Respectfully submitted,

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